

9. Summary

Conditioning of Food Intake in the Mother-Kid-Relation in Goats

This study investigated the consequences of food intake and social learning, both of which have a major influence on foraging behavior. Young herbivores acquire a preference for food that is preferred by their mothers. This preference which is acquired early in life from the mother's example may significantly determine food selection later in life. In addition to the mother's influence, postingestive feedback from the gastrointestinal tract, such as the negative consequences of ingesting food with high concentration of tannin have a major influence on diet selection. The conditioning of kid's food intake by mother's example may compete with the learning of postingestive consequences in kid's food selection learning. We determined whether goat kids would follow their mother's example even if negative postingestive feedback favored a different food selection. We hypothesized that the mother's example influences food selection of her kids, persistently and independently of the food's postingestive feedback.

Fifteen goat kids were divided into two groups. High-energy foods were given twice daily for a 5-minute period six times during the learning period with their mothers. In this period the kids could observe their mother's diet selection. This was followed by two test periods without their mothers for five and four days, respectively. Two foods differing in tannin concentration were used to provoke two different consequences after intake; two foods differing in flavor were used as distinguishable foods without differences in consequences after intake. In each feeding the kids had a choice between two foods. For the morning feeding the choice was between two foods differing in tannin concentration, in the evening the feeding choice was between two foods differing in flavor.

During the learning period the kids were four to eight weeks of age. After this time the kids underwent two test periods. The first test phase, which lasted five days occurred when the kids were 11 weeks old; the second test phase, which lasted four days, occurred when the kids were 14 weeks old. During these periods all the kid's food intake of tannin containing or flavor containing high-energy food was measured.

During the initial learning period food was simultaneously given to the mother and her kid in such a manner that they could eat together from one of two food boxes. These food boxes were fixed at two feeding places three meters apart in a pen. The

boxes were subdivided with two plastic containers that were open either to the mother or to the kid. With the access to their food separate mother and kid could eat at the same place even though each received different food. Kids of group A were offered food that the mother would reject in a feeding place of mother's preference, whereas both kids and mothers of group B were offered identical foods at both feeding places. We compared food intake of kids during learning period and test periods.

The following results were obtained:

- 1) The mother's example influenced food selection of the kids in the learning period. The kid's food selection was positively influenced by their mother's choice of a feeding place.
- 2) The mother influenced their kid's food selection when she was present, but the mother's prior example had no influence on the kid's later diet-selection. In the mother's absence the kid's diet selection was consistent with food selection learning from postingestive feedback. The concentration of tannin in the food had a negative influence on food selection, whereas different aromas had no influence on food selection, even though the mother favored one aroma by choosing a feeding place during the learning period.
- 3) When developing feeding behavior, the example of the mother's diet selection competes with learning from postingestive consequences. By feeding simultaneously, the mother's example increases the familiarity with her selection and facilitates similar diet selection.
- 4) However, if a food causes negative postingestive feedback in the kid, their own experiences determine the kid's diet selection despite their mother's example. Negative postingestive feedback limits food intake in goat kids in the absence of a mother.

These results support the fact that the training of goat kids by manipulating their food choice with their mother's example does not result in a permanent change in diet selection. Food intake is limited by the capacity of the animal to cope with the negative postingestive consequences, learning from mother's example has a minor influence on food selection.